CLAIMS

1. A method of treating mechanical allodynia comprising administering to a therapeutically effective amount of a compound which inhibits the function of an NMDA ε4(NR2D) receptor protein.

2. A method according to claim 1, wherein the compound for inhibiting the function of an NMDA ε4(NR2D) receptor protein is an antagonist of the NMDA ε4(NR2D) receptor protein.

3. A method according to according to claim 2, wherein the antagonist is selected from the group consisting of

(±)-4-(4-phenylbenzoyl) piperazine-2,3-dicarboxylic acid (PBPD); (R,E)-4-(3-phosphonoprop-2-enyl)piperazine-2-carboxylic acid (D-CPPene); (±)-6-(1H-Tetrazol-5-ylmethyl)decahydroisoquinoline-3-carboxylic acid (LY23353); α-Amino-5-(phosphonomethyl)[1,1'-biphenyl]-3-propanoic acid (EAB515); cis-4-(phosphonomethyl)piperidine-2-carboxylic acid (CGS 19755); D,L-(E)-2-amino-4-propyl-5-phosphono-3-pentenoic acid (CGP 39653); Tanshinone IIA; tanshinone IIB; 2-(3-methylphenyl)-2-adamantanemethanamine (CEB-1604); N1,N4,N8-tri-benzyl-spermidine (TB-3-4); and Memantine.

4. A pharmaceutical composition for treating mechanical allodynia comprising a compound as defined in claim 1 and a pharmaceutically acceptable diluent or carrier.

5. A method of screening for a compound which binds to NMDA ε4(NR2D), the method comprising the following steps (a) to (c):

(a) contacting NMDA ε4(NR2D) receptor protein with a test compound;

(b) detecting the binding of the test compound to NMDA ε4(NR2D) receptor protein; and

(c) selecting a test compound that binds with the NMDA ε4(NR2D) receptor protein.

6. A method of screening for a compound which binds to NMDA ε4(NR2D), the method comprising the following steps (a) to (c):

(a) contacting a test compound with a cell that expresses an NMDA ε4(NR2D) receptor gene in the presence of a ligand of the NMDA ε4(NR2D) receptor protein;

(b) detecting the activation of the NMDA ε4(NR2D) receptor; and

(c) selecting a compound for inhibiting the activation of the NMDA ε4(NR2D) receptor by comparison to the activation detected in the absence of the test compound.

7. A method of screening for a compound which binds to NMDA ε4(NR2D), the method comprising the following steps (a) to (c):

(a) contacting a test compound with a cell that expresses an NMDA ε4(NR2D) receptor gene;

(b) measuring the expression level of the NMDA ε4(NR2D) receptor gene; and

(b) selecting a compound that decreases the expression level in comparison to the level detected in the absence of the test compound.

8. A method of screening for a compound which binds to NMDA ε4(NR2D), the method comprising the following steps (a) to (c):

(a) contacting a test compound with a cell or cell extract containing DNA where the transcriptional control region of the NMDA ε4(NR2D) receptor gene is functionally linked to a reporter gene;

(b) measuring the expression level of the reporter gene; and

(c) selecting a compound that decreases the expression level of the reporter gene measured in step (b) above by comparison to the measurement conducted in the absence of a test compound.

9. A method for the determination of mechanical allodynia comprising; detecting abnormality of DNA in an NMDA ε4(NR2D) receptor gene or the control region of the gene.

10. A method for the determination of mechanical allodynia comprising a step of detecting the expression of an NMDA ε4(NR2D) receptor gene or the molecular weight of the expressed gene product.

11. A test agent for use in the determination of mechanical allodynia comprising a nucleic acid which hybridizes to an NMDA ε4(NR2D) receptor gene or the control region of the gene and contains at least the strand length of 15 nucleotides.

12. A test agent for use in the determination of mechanical allodynia comprising an antibody that binds with an NMDA ε4(NR2D) receptor protein.